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10/039,063	12/31/2001	Pradeep K. Subrahamanyan	STL10377/40046.179USU1	9119

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EXAMINER	
TZENG, FRED	

ART UNIT	PAPER NUMBER
2651	

DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/039,063	Applicant(s) SUBRAHAMANYAN ET AL.	
	Examiner Fred Tzeng	Art Unit 2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,11-17 and 19-23* is/are rejected.

7)☒ Claim(s) *2-4,6-10,18 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-24 are presented for examination.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. Claim 5 is objected to because of the following informalities: "...the preamplifier..." in line 8 lacks of antecedent basis. Appropriate correction is required.

4. Claim 17 is objected to because of the following informalities: "...the servo data..." in line 8 lacks of antecedent basis. Appropriate correction is required.

5. Claim 17 is objected to because of the following informalities: "...the track..." in line 9 lacks of antecedent basis. Appropriate correction is required.

6. Claims 16-19 are objected to because of the following informalities: Claims 16-19 are method claims, but improperly depending on apparatus claim 1. Appropriate corrections are required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 5, 16, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takano et al (USPN 6,683,744), hereafter as Takano, in view of Greene et al (USPN 6,140,815), hereafter as Greene.

Regarding claim 1, Takano discloses the invention substantially as claimed. Takano discloses a spin-stand positioning system for positioning a transducer head at a desired position relative to a data storage disc rotating on a spindle subsystem (see column 1 lines 7-11, 66-67 and column 2 lines 1-6 or figure 2, i.e., the spin-stand shown in figure 2 positioning transducer head 13 at a desired position on disc 1 which rotated by spindle 12 for an evaluation), the positioning system comprising: a rotary micropositioning stage comprising a rotary actuator arm having an axis of rotation and supporting the transducer head relative to the data storage disc, a voice coil motor connected to the rotary actuator arm for positioning the rotary actuator arm in response to control current (see column 2 lines 7-9, 30-32 and figure 2, i.e., the 'θ' stage 15 being the rotary micropositioning stage, the rotary actuator arm supporting transducer head 13 relative to disc 1, the VCM 14 or see column 9 lines 64-66, column 10 lines 7-40 and figure 8, i.e., the positioner rotating stage 100 being the rotary micropositioning stage comprising rotary actuator arm 104 having an axis of rotation 106 and supporting

transducer head 102 relative to disc 1, a VCM 105 connected to the rotary actuator arm 104 for positioning in response to control current); a coarse positioning stage supporting the rotary micropositioning stage operable to position the transducer head at the desired position relative to the data storage disc (see column 2 lines 9-13, 30-32 or figure 2, i.e., the stage 16 is the coarse positioning stage supporting the rotary micropositioning stage 15 operable to position the transducer head 13 at the desired position relative to disc 1 for evaluating purpose, or see column 10 lines 11-13, i.e., the stage 16 is the coarse positioning stage supporting the rotary micropositioning stage 100); and a position control subsystem connected to supply control current to the voice coil motor to maintain the transducer head at the desired position relative to the data storage disc as the data storage disc rotates (see column 13 lines 61-67 and column 14 lines 1-4, and column 12 lines 27-31, 40-45 and figure 8, i.e., the Feedback compensator 203 and power amplifier 10 being the position control subsystem to supply control current to VCM 105 to maintain the head 102 at the desired position on disc 1 for evaluation as disc 1 rotating).

However, Takano does not specifically disclose the implementation of using an encoder for measuring an angular position of the rotary actuator arm.

Greene teaches using an encoder 15 for measuring the positions of the micropositioning carriage 12 in a high stability spin-stand platform 10 (see column 4 lines 1-15).

Takano and Greene are combinable as they are from the same field of endeavor. It would have been obvious to one having ordinary skill in the art at the time the

invention was made to incorporate Greene's invention of using an encoder for measuring positions into Takano's spin-stand system in order to build a high bandwidth, large stroke spin-stand for testing components of a disk drive, because Greene's encoder for measuring the positions of the micropositioning carriage 12 can be modified to measure an angular positions of a rotary actuator arm for enhancing the stability of a spin-stand, which is essential for building a high bandwidth, large stroke spin-stand.

Regarding claim 5, Takano discloses a demodulator connected to a preamplifier to generate from servo data read from the data storage disc a track identifier specifying an identified track on the data storage disc and a position error signal characterizing an offset of the transducer head relative to the identified track (see column 1 lines 27-32 and column 12 line 56 – column 13 line 8, i.e., the demodulating circuit 7).

Regarding claim 16, Takano discloses the rotary actuator arm has an axis and further comprising: balancing the rotary actuator arm and attached components about the axis of the rotary actuator arm (see column 12 lines 21-23, i.e., the rotary actuator arm 104 has an axis 106 and is balanced/free up by positioner rotating stage 100).

Regarding claim 17, Takano discloses detecting servo data from the data storage disc (see column 11 lines 30-34); and evaluating servo data and detected angular position to generate a position error signal adjustment parameter, thereby redefining track as more circular on the data storage disc (see column 11 lines 35-43 and column 12 lines 64-67 and column 13 lines 5-8, i.e., the detected angular position eccentricity data by position detecting section 206 is evaluated against the temporary written servo

data to generate a PES adjustment parameter for canceling the eccentricity of disc 1 to make the tracks on the disc 1 more circular).

Regarding claim 19, Takano discloses detecting servo data from the data storage disc (see column 11 lines 30-34); and adjusting control current to the voice coil motor in accordance with the detected angular position, if the servo data is not consistent with the detected angular position (see column 13 lines 9-35, 61-67 and column 14 lines 1-31, i.e., the current applied to VCM 105 is adjusted by feedback compensator 203 along with power amplifier 10 in accordance with the detected angular position eccentricity, if the temporary written servo data is not consistent with the detected angular position eccentricity).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 11-15, 20-23 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Takano et al (USPN 6,683,744).

Regarding claim 11, Takano discloses a method of positioning a transducer head at a desired position relative to a data storage disc rotating on a spindle subsystem (see

column 10 lines 7-16, i.e., positioning head 102 to a desired position on disc 1 rotated by spindle motor 12 for signals recording or reproducing), the transducer head being supported relative to the data storage disc by a rotary actuator arm (see column 10 lines 17-19, i.e., head 102 being supported relative to disc 1 by a rotary actuator arm formed by rotary positioner 104 and suspension 103), a voice coil motor rotating the rotary actuator arm (see column 10 lines 27-33, i.e., the VCM 105 rotating the rotary positioner 104), the method comprising: receiving position data specifying the desired position on the data storage disc (see column 11 lines 15-21, i.e., the temporary servo position data previously written are received and read by head 102); detecting an angular position of the rotary actuator arm (see column 13 lines 5-8, i.e., the angular position of rotary actuator arm 104 is detected by position detecting section 206, also see column 12 lines 27-31); evaluating the detected angular position against the position data (see column 12 lines 40, 64-67 and column 13 lines 1-4, 9-16, i.e., the detected eccentricity angular data is evaluated against PES position data); and adjusting control current applied to the voice coil motor to rotate the rotary actuator arm, based on the detected angular position of the rotary actuator arm, to position the transducer head at the desired position relative to the data storage disc as the data storage rotates (see column 12 lines 27-31, and column 13 lines 9-35, 61-67, column 14 lines 1-31, i.e., the signal for difference between the resulting head position signal and eccentricity is converted into current applied to VCM 105 by feedback compensator 203 and power amplifier 10 for controlling the positioning of the rotary positioner 104).

Regarding claim 12, Takano discloses receiving an input position command specifying the desired position of the transducer head relative to the data storage disc (see column 11 lines 15-21, i.e., input position command is received to cause head 102 to read desired temporary written servo position signals).

Regarding claim 13, Takano discloses comparing the detected angular position against the input position command to determine a difference between the desired position of the transducer head relative to the data storage disc and a current position of the transducer head relative to the data storage disc (see column 11 lines 35-43, i.e., the detected angular position eccentricity data is compared with the input position eccentricity data stored from memory to determine a difference).

Regarding claim 14, Takano discloses determining servo data from the data storage disc specifying the desired position of the transducer head compared to a current position of the transducer head relative to the data storage disc (see column 11 lines 15-21, i.e., the temporary written servo data is determined and read by head 102 to specify a desired position of the transducer head 102 compared to a current position of it relative to disc 1).

Regarding claim 15, Takano discloses comparing the detected angular position with the servo data to determine a difference between the desired position of the transducer head relative to the data storage disc and the current position of the transducer head relative to the data storage disc (see column 10 lines 50-56 and column 11 lines 27-57, i.e., the detected angular displacement/fluctuation of head 102 is

compared with the temporary written servo data to determine a difference between the desired position of head 102 and the current position of head 102).

Regarding claim 20, Takano discloses a spin-stand (see column 2 lines 1-2 and figure 2) comprising: a spindle subsystem for rotating a data storage disc having a radial track position (see column 2 lines 2-6, i.e., the spindle subsystem 12 for rotating disc 1 having radial track position), and means for positioning a head relative to the radial track position on the data storage disc (see column 2 lines 1-13 and figure 2, i.e., the carriage 14 positions head 13 relative to the radial track position under evaluating on disc 1).

Regarding claim 21, Takano discloses means for detecting angular position of a rotary actuator arm (see column 2 lines 7-9 and figure 2, i.e., the 'θ' stage 15 adjusts and detecting angular position of the rotary actuator arm which supporting head 13 rotated by carriage 14).

Regarding claim 22, Takano discloses means for detecting servo data from the data storage disc (see column 11 lines 15-21, i.e., the head 102 is used for detecting and reading the temporary written servo data from disc 1).

Regarding claim 23, Takano discloses a rotary positioning stage having a rotary actuator arm (see column 10 lines 11-21, i.e., the rotary positioning stage 100 having a rotary actuator arm formed by rotary positioner 104 and suspension 103).

Allowable Subject Matter

11. Claims 2-4, 6-10, 18 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 2 and 24 are allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a spin-stand positioning system having a Halbach array voice coil motor for moving a transducer head.

Claims 3 and 4 are allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a spin-stand having a rotary micropositioning stage which comprising a preamp board, an encoder plate attached to the rotary actuator arm and being operably coupled to the encoder to determine the angular position of the rotary actuator arm.

Claim 6 is allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a spin-stand comprising a processor adjusting control current to the voice coil motor in accordance with the position error signal, if the position error signal and track identifier are consistent with the angular position measured by the encoder.

Claim 7 is allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a spin-stand comprising a processor bypassing adjustment of control current to the voice coil motor in accordance with the position

error signal, if the position error signal and track identifier are not consistent with the angular position measured by the encoder.

Claim 8 is allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a spin-stand comprising a processor adjusting control current to the voice coil motor in accordance with the angular position measured by the encoder, if the position error signal and track identifier does not agree with the angular position.

Claim 9 is allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a spin-stand comprising a processor evaluating the position error signal, track identifier, and angular position measured by the encoder to generate a position error signal adjustment parameter to redefine the track as substantially circular on the data storage disc.

Claim 10 is allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a spin-stand comprising a processor for translating the angular position measured by the encoder to a radial position of the transducer head relative to the data storage disc.

Claim 18 is allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a spin-stand for testing components of a disk drive by first detecting servo data from a data storage disc, and bypassing adjustment of control current to a voice coil motor in accordance with the position error signal, if the servo data is not consistent with the angular position measured by the encoder.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

13. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 308-9051, (formal communications, please mark "EXPEDITED PROCEDURE")

Or:

(703) 308-6606 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington. V.A., Sixth Floor (receptionist).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Tzeng whose telephone number is 703-305-4841. The examiner can normally be reached on weekdays from 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 703-308-4825. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-746-5710 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Fred F. Tzeng

June 20, 2004